

### REMARKS

This Amendment is in response to the Examiner's Action dated 29 November 2004. Applicants thank the Examiner for the careful review of the specification and claims. Applicants note the examination of Group I, claims 1-19 and 33-45.

The Examiner has objected to the dependency of claims 5 and 35. Applicants have amended these claims to remedy the formal dependency. Claim 42 has been amended to correct the misspelling. Applicants have amended the specification to include the Grignard reagent and to insert the reference to related applications. Other formal amendments are made to increase readability. No new matter is added with this amendment. The use of a Grignard reagent was supported in the claims as filed.

The Examiner has rejected claims 1-19 under 35 U.S.C. § 112 with respect to the recitation of "the layers". Applicants have formally identified the layers in the amended claims.

Claims 3, 6 and 7 are rejected under 35 U.S.C. § 112 with respect to the recitation of "the cellulosic layer". Applicants have amended the claims to identify the paper or paperboard layers referred to in the claims.

Claim 9 has been rejected under 35 U.S.C. § 112 with respect to the recitation of the proportions of reactive components. Claim 9 has been cancelled without prejudice.

Claim 18 has been rejected under 35 U.S.C. § 112 with respect to the recitation of a "second" and a "third" layer. Claim 18 has been amended to recite that the critical structure contains at least a paper layer, a clay layer and an ink layer. Support for this amendment is found at page 6, line 28 et seq. and page 18, line 17 et seq. The purpose of this structure is to be printable and to contain a printable layer. The specification clearly explains that the printing is typically formed on a structure having a clear layer to the exterior of a paper layer. No new matter is entered into this claim by way of amendment.

Claims 33-45 have been rejected under 35 U.S.C. § 112 with respect to a similar concern regarding the "second" layer. The claim has been amended to correct this formal recitation.

Lastly, claims 36 and 37 have been rejected under 35 U.S.C. § 112 with respect to the recitation of "the cellulosic layer". Applicants have formally amended the claim to refer to a paper substrate referred to in independent claim 33.

### Art Rejections

In the discussions of the art rejections, certain rejections have been combined for convenience.

The Examiner's rejection is under 35 USC § 103. An obviousness rejection is based on a review of the invention as a whole including the problems solved and the elements used in the solution. In this invention, the release of volatile compound from printed matter requires reduction. Compounds like formaldehyde, acetaldehyde, etc. are at least objectionable to many people and can be a severe problem in (e.g.) food packaging. No reference in the cited art relates to the problem of a reduction in volatile organic compounds from printed materials. No reference in the cited art enables the reduction of such volatiles from the printed matter. A rejection under 35 U.S.C. § 103 requires some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the references or to combine the reference teachings without hindsight to the claimed invention, there must be some reasonable expectation of success and the prior art reference must teach or suggest all claim limitations.

The Examiner is not permitted to use the specification to supply an element of the rejection. In the absence of a primary reference relating to the problem of volatiles and an enabled solution, an obviousness rejection is incomplete and must be withdrawn. *In re Fine*, 837 F.3d 1071 (Fed Cir 1988). The Examiner cannot rely on an argument of inherency in an obviousness rejection. See *In re Ochiai*, 71 F.3d 1565 and *In re Robertson*, 169 F.3d 743 (Fed Cir 1999).

The Examiner has rejected claims 1, 4, 5, 8, 9, 14 and 19 under 35 U.S.C. § 103(a) over Okabe et al., U.S. Patent No. 4,818,588 in view of Santurri et al., U.S. Patent No. 3,936,560. Since neither of these references teach a reactive material that can trap volatile organic carbonyl compounds, the rejection must fail. Applicants respectfully traverse the rejection.

The Examiner should note that the claimed invention relates to a printable substrate containing a volatile organic compound that can trap volatile organic carbonyl compounds arising from printing substrate residues formed during the manufacture of the printable material or the ink add-on. Any volatile organic carbonyl materials can be objectionable by a large

proportion of the population due to their strong odor, and often the response of the individual to the presence of the carbonyl compounds. In order to prevent the release and to trap the carbonyl containing compounds into the printable layers, Applicants have introduced a reactive compound into the layers that react with and trap the carbonyl materials. The specification discusses in detail the degree of reactivity required for carbonyl trapping. Simple, relatively unreacted compounds cannot achieve such a result. The Examiner should also note that none of the cited references teach the reduction of volatile carbonyl compounds.

The Okabe et al. reference generally teaches printable substrates. Applicants do not acquiesce in the Examiner's position that the printable substrate in this reference is the same as the printable substrates defined in the claims since there appears to be a number of important differences. Okabe teaches nothing about reduction of volatiles.

Applicants direct the Examiner's attention, however, to the Santurri et al. reference. The Santurri et al. reference combines, in a packaging material for ferrous metals, an amide compound and a nitride compound. Santurri et al. reference, teaches that the packaging material is designed to be both a moisture vapor barrier material and a corrosion (rust) inhibitor for a ferrous metal surface. Santurri et al. teach at Column 2, line 39; Column 2, line 60 and Column 3, line 40 through Column 4, line 9, a combination of nitride compound and an amide compound as a corrosion inhibitor compound. The materials prevent water from penetrating the packaging. Any moisture that does penetrate cannot corrode due to the inhibitor's presence. These corrosion inhibitors prevent rust and corrosion by providing antioxidant properties at the metal surface. There is no mention in either Okabe et al. or Santurri et al. regarding the use of the reactive material to trap volatile organic carbonyl compounds. In the absence of some teaching that these layers can be effective in reducing the release of carbonyl materials from the packaging layers, the Examiner's rejection must fail.

A rejection under 35 U.S.C. § 103 requires some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the references or to combine the reference teachings without hindsight to the claimed invention, there must be some reasonable expectation of success and the prior art reference must teach or suggest all claim limitations.

The Examiner's rejection does not meet these requirements. First, there is no suggestion to use the technology in these references in Applicants' structures since the prior art references

do not relate to any active material (Okabe et al.) and secondly, the Santurri et al. materials refer to an entirely different technical problem.

There can be no expectation of success in removing carbonyl materials from the packaging since there is no suggestion that the included compounds have any impact on the packaging and imply that the only result is protecting the packaged ferrous metals. Lastly, the prior art references do not teach or suggest all the claim limitations since the references have nothing to do with regard to carbonyl trapping or carbonyl compounds resulting from printable layers. The basis of the rejection is the Okabe et al. reference teaches the printable material while one of ordinary skill in the art would use the Santurri et al. material to trap aldehydes. In the absence of some teaching from the Okabe et al. reference or from the art in general, one would never look at the Santurri et al. reference to obtain reactive materials for inclusion in the Okabe et al. structures. There is simply no suggestion or direction to make that modification of Okabe et al.

The Examiner has rejected claims 2, 3, 6, 7, 18, 33-37, 41, 44 and 45 under 35 U.S.C. § 103(a) over Okabe et al. and Santurri et al. as suggested above, but further in view of Hoffman, U.S. Patent No. 5,882,746. Applicants do not acquiesce in the Examiner's position that the structures in Okabe et al. and Hoffman are at all similar. They clearly are not and the references, as a whole, do not suggest carbonyl trapping technology. Applicants respectfully traverse the rejection.

Okabe et al. and Santurri et al. are applied as above and the Examiner further argues that the clay layers of Hoffman could be used in the structures of Okabe et al. Hoffman teaches nothing about control of volatiles. Applicants suggest that such a combination of the Hoffman and Okabe et al. reference is not reasonable in light of the teachings of these references. The Okabe et al. reference is primarily a polyolefin-layered structure while the Hoffman reference is primarily a clay-coated paper having an entirely different structure. Even though the claims are relatively broad, the ordinary skilled artisan would not combine the Okabe et al. and the Hoffman reference since their structures are so completely different unless these references were selected by hindsight. Further, Hoffman relates to improving the printable nature of the paperboard materials and to improving water resistance of the paperboard laminate. Nothing in Hoffman can relate to the problem of the invention.

The Examiner has rejected claims 10, 12, 13, 15, 17 and 38-40 under 35 U.S.C. § 103(a) over Okabe et al. and Santurri et al. as applied above, and further in view of Czornij et al., U.S. Patent No. 5,378,762. The Examiner argues that the Okabe et al. and Santurri et al. references do not suggest using hydrazine and hydrazide like reactive compounds in the claimed layers. Applicants point out that the Czornij et al. fully reacts hydrazide with an isocyanate or other reactive compound. The reaction forms a non-reactive coating with no reactive residual hydrazide in the final structure. Since such a non-reactive coating cannot absorb a carbonyl compound, Applicants respectfully traverse the rejection.

To further illustrate the failure of the reference, Czornij et al., at Column 1, lines 49-56, state that the invention is a polymeric dispersion for pigments including pigment interactive functionality "grafted onto the copolymer". The resulting functionality enhances pigment dispersion but cannot absorb volatiles. The patent, at Column 2, lines 23-49, suggests that a hydrazide compound is reacted with a polymer functional group to introduce a group onto the polymer to enhance dispersibility. A hydrazide compound can be reacted with functional groups on the polymer resulting in a non-reactive coating polymer (see Column 2, lines 23-49). This is further shown at Column 5, lines 9-43, where the reference teaches that the substituent is grafted onto the polymeric backbone with a reactive functionality and a compound such as a hydrazide. At Column 6, line 59 et seq., the patent suggests that isocyanate functionality remaining unreacted after coating polymer formation can be used in such a reactive mode to react with the hydrazides. This is further exemplified in Example 2 at Column 9, line 36, that benzoic hydrazide is added to a copolymer preparation. Clearly, this reference suggests the hydrazide material is fully reacted and is not reactive in the coating once the coating is formed. Without hydrazide reactivity in the coating, the required trapping of the volatile carbonyl compounds cannot be obtained. Czornij et al., simply does not suggest the use of a reactive hydrazide.

The Examiner rejected claim 16 under 35 U.S.C. § 103(a) over Okabe et al. in view of Santurri et al. and further in view of Malhotra et al., U.S. Patent No. 5,500,668. Applicants respectfully traverse the rejection.

Applicants have demonstrated that neither the Okabe et al. reference nor the Santurri et al. reference relates to the claimed invention. Malhotra et al. provide nothing about absorbing volatiles. Malhotra et al. provide nothing that remedies the failure of these references to teach the invention. The Malhotra et al. disclosure is a unique recording sheet having a complex structure. The reference suggests that bisulfite can be used in forming a sheet with a salt. Nothing in this reference suggests that the sulfite salt can be used as a volatile carbonyl compound trapping agent or that the substrates in the reference have any volatile carbonyl problems. Since this reference neither teaches the claimed technology or an active carbonyl trapping compound, in that role, the rejection must fail. Applicants respectfully traverse the rejection.

The Examiner rejected claim 16 under 35 U.S.C. § 103(a) over Okabe et al. in view of Santurri et al. and further in view of Hoffman, U.S. Patent No. 5,882,746 and Kohyama et al., U.S. Pat. No. 5,262,228. Since Kohyama et al. teach a non-reactive catalyst. Applicants respectfully traverse the rejection.

The Kohyama et al., U.S. Patent No. 5,262,228, reference portions cited by the Examiner (Abstract and Column 9, lines 20-30) do not use a carbonyl reactive material to act as a material that traps carbonyl compounds in the structure. The Kohyama et al. reference teaches that a catalyst can be made by combining a number of metal compounds including a magnesium compound to form a catalyst residue. Such catalysts are not taught to have any carbonyl reactive capacity. In fact, catalyst residues are used at small amounts and affect reaction rates but are not reactive, in and of themselves and, as such, will not by definition react with the carbonyl compounds to trap carbonyl compounds in the structure. Accordingly, the Examiner's rejection must fail.

In view of the above amendments and remarks, Applicants respectfully request a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

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Date

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